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To Save the Spectacled Flying Fox

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By TODD VAN TASSEL

IT WAS NOVEMBER Of 1990 when Bruce and Ann Johnson decided to check whether a recent cyclone had caused any damage to a local colony of spectacled flying foxes (*Pteropus conspicillatus*) near their home in Millaa Millaa, North Queensland in Australia. But any cyclone damage was overshadowed by the flying foxes they found dead upon the damp earth. Upon closer examination, they discovered fully engorged adult paralysis ticks (*Ixodes holocyclus*) on the bats' necks. One of the people to whom the Johnsons reported their findings was Dr. Hugh Spencer, a bat researcher and director of the Cape Tribulation Tropical Research Station, nearly 200 miles to the north.

But no one realized the actual magnitude of the problem until almost a year later when the Johnsons went to survey a maternity colony of spectacled flying foxes at Zillie Falls, a local tourist area in the Atherton Tablelands of North Queensland. Once again there were scores of dead and dying flying foxes scattered on the forest floor. Infants were clinging to paralyzed mothers. Other babies, whose mothers had died, were climbing small trees, bleating piteously. A frantic rescue operation immediately ensued, the Johnsons picking up babies and any adult bats that looked as though they might survive. A call for help to Hugh Spencer and his wife, Brigitta Flick, brought the assistance of the research station's volunteers, some literally just off the plane.

During the initial recovery operation, 488 flying foxes were found. Volunteers took 114 adults, along with 232 babies, back to the Johnson's house for treatment. The remaining bats, which showed little chance of surviving, were euthanized at their roost site. While heroic efforts were made to save the afflicted adults, the finer points of tick anti-toxin treatment of bats were unknown at this early time, and only 28 of the adults survived.

The Johnsons now possessed over 200 helpless infants requiring immediate care. Human foster parents were quickly found to care for them. Fortunately, a great deal of information on caring for infant flying foxes was available from bat care groups elsewhere in Australia, primarily in Sydney and Brisbane. Specialized teats, bottles, and bat infant formula were distributed to the foster parents who were asked to raise the bats for three to four months, help the infant learn to fly, and then-the most difficult part of all-give the animals up for collection into release cages set up near healthy flying fox colonies. After one to two months of partial isolation from humans, and after the tick infestation period had passed, the juveniles were released. Here, they were successfully adopted by the local colony and taught to forage.

After the experience of being a foster parent to an infant bat, Pam Tully was so concerned by the plight of the bats that she decided to purchase land and set up a bat "hospital" near the Zillie Falls colony, with the expectation of moving there to live. This hospital has since become the center of all rescue efforts, greatly increasing the effectiveness of the work, and enabling volunteers and staff to live there during the tick season from September to December. The peak of the season also coincides with the birthing period of the spectacled flying fox, explaining why so many infants are orphaned.

To coordinate efforts, volunteers formed a group they called The Friends of the Far North Spectacled Flying Fox, which has its headquarters at the bat hospital. Along with rehabilitating scores of bats, these volunteers have collected much-needed data on the nature and treatment of the paralysis tick problem. By 1992 enough was known to reverse paralysis and save about 40 percent of the afflicted adult bats, considerably more successful than the first year. To date, this effective rescue program has released some 650 orphans back into the wild. A small grant from the Wet Tropics Management Agency enabled the purchase of three release cages and sufficient anti-toxin to treat the afflicted bats.

QUESTIONS ARISE as to why the flying fox population, seemingly unaffected until 1990, has fallen prey to such a devastating pest. Actually, a problem had been noticed as early as 1986 but went uninvestigated, and the cause misdiagnosed. A zoologist working in the rain forest in the Millaa Millaa area had ascribed the deaths to agricultural poisoning. Hugh Spencer believes that continued clearing of forests, which creates changes in the availability of food in the immediate area, has brought ticks and bats into contact. In addition, a drought, which has lasted for over seven years, has forced the bats to forage on or close to the ground during periods of food shortage.

Spectacled flying foxes are nocturnal fruit- and nectar-feeders that are dependent on the rain forest for both feeding and roosting sites. But over the last 200 years, more than 50 percent of Australia's northern forest has been cleared for agricultural or commercial use, leaving only small pockets of intact, primary rain forest spread over a large area. Deforestation has left the bats' natural habitat fragmented, severely decreasing their main food supply of native fruits and flowers. Left with no alternative, bats have ventured outside the rain forest, establishing new foraging sites closer to humans, while roosting in places like Zillie Falls, one of the most isolated patches of rain forest.

In the abandoned and degraded pasture lands around Zillie Falls, an exotic "wild tobacco" plant (*Solanum mauritianum*), a member of the tomato family, grows in abundance and fruits during the time that female bats give birth. Close to the colony site and highly nutritious, these plants offer an easy alternative food source. The problem is that the wild tobacco, often standing six feet tall, provides an ideal height for paralysis ticks to climb and wait for their next host. Spencer suggests that as a flying fox forages, ticks attach themselves to the bat, which then returns to the colony.

The paralysis tick naturally occurs in Australia, and most native mammals develop some degree of immunity to the neurotoxin secreted by the adult female tick; flying foxes possess no such immunity. If spectacled flying foxes in the region are becoming dependent on wild tobacco, we may see a steady decline in their populations. The Zillie Falls colony has been hit particularly hard with nearly 3,000 bats lost during the first two years of the rescue operation.

SOLUTIONS ARE FEASIBLE but require significant commitment toward the preservation of North Queensland rain forests. Reestablishing large tracts of forest would provide bat colonies with safe feeding sites and lessen their need to forage in the low-lying exotic fruit orchards where they run into conflict with growers. A good portion of the deforested area surrounding the fragmented forest sections could be restored and used for agroforestry and other sustainable industries, providing long-term profits to land owners, and creating forest habitat for bats and hundreds of other rain forest creatures. Government support, however, is essential for such a long-term and costly endeavor.

Dr. Paul Robertson, director of the Centre for Rainforest Studies in Yungaburra, notes that even now in the Atherton Tablelands area, tens of thousands of native rain forest trees are planted each year by the government and grassroots landcare organizations, as well as by the Centre for Rainforest Studies. Many of the new trees are species that provide food for flying foxes. Furthermore, most of these are being planted on public land, which is fully protected. Robertson believes that, in the long run, the planting program has a good chance of making a substantial and positive impact.

But greater measures may be required to save the spectacled flying fox. In 1984 four species of flying foxes were removed from Queensland's Fauna and Conservation Act of 1974 because of their reputation for destroying commercial fruit crops, even though bat damage to orchards has been greatly exaggerated. Continuing negative

press has only added to the controversy, leaving the public with a distorted image of these exquisite and indispensable creatures, and obscuring their role as seed dispersers for a wide variety of rain forest trees. Flying foxes are Australia's only mammals with the ability to disperse seeds and pollen from one rain forest tract to another.

Since flying foxes have been legally considered only as pests, no official conservation strategy for them currently exists. In March 1993, they were given marginal protection in Queensland by being listed simply as native fauna (an unspecified category) rather than vermin. Conservationists had hoped that flying foxes would receive protected listing early in 1995, but this did not occur. Efforts to afford them even basic protection will need to be intensified.

Grassroots movements, such as the paralysis tick rescue effort, have been the foundation for most conservation activities on behalf of flying foxes in Australia. They are a vital link between the public and the government, but with lack of official support and laws to protect the bats, cooperation between conservation groups and the National Parks and Wildlife Service has been difficult. Without concerned citizens acting in defense of wild animals, species like the spectacled flying fox can disappear without a whisper. The effort to save this bat encompasses not only the protection of a species but will also require a change in attitude toward the bats themselves and a new understanding and appreciation for their role in the delicate and complex systems that shape and preserve the rain forest.

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Volunteer groups in Australia have much experience in providing foster care to orphaned flying foxes, like this grey-headed flying fox (Pteropus poliocephalus) infant. Their expertise was invaluable in saving the lives of baby spectacled flying foxes in Queensland when tick paralysis struck their mothers.



Along with Australia's other flying foxes, spectacled flying foxes (above) are primary pollinators and seed dispersers for many rain forest trees, such as this tea tree (Melaleuca leucodendron).



Pam Tully's bat hospital (left) has become the center of all spectacled flying fox rescue efforts during the tick season. As their stricken mothers die, young bats are being saved by volunteers. Grassroots groups like this one are the foundation for most bat conservation activities in Australia.

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